PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference FP2004-144WO	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/JP2004/019020	International filing date *(day/month/year)* 20 December 2004 (20.12.2004)	Priority date *(day/month/year)* 25 December 2003 (25.12.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant Rohm Co., Ltd.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 22 August 2006 (22.08.2006)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Yoshiko Kuwahara e-mail: pt07@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)*
Applicant's or agent's file reference FP2004-144WO	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/019020	20.12.2004	25.12.2003

International Patent Classification (IPC) or both national classification and IPC

Applicant
Rohm Co., Ltd.

1. This opinion contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP Facsimile No.	Authorized officer Telephone No.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019020

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material

      ☐ in written format

      ☐ in computer readable form

   c. time of filing/furnishing

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in computer readable form.

      ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019020

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	4, 7	YES
	Claims	1-3, 5, 6	NO
Inventive step (IS)	Claims	4, 7	YES
	Claims	1-3, 5, 6	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims		NO

2. Citations and explanations:

The following document is cited in the ISR.

Document 1: JP 2002-76427 A (Citizen Watch Co., Ltd.), 15 March 2002

- Regarding claims 1-3 and 6

Document 1 (particularly paragraphs 0019-0020) describes an infrared communication module comprising an infrared light-emitting device, infrared light-receiving device, and IC chip, wherein there is an electromagnetic shielding member having a protrusion protruding toward an adhesive layer side. Based on the description in document 1, it is clear that there is a space around the protrusion to have an adhesion to be accumulated.

Also, providing at least three protrusions, or configuring the protrusion so as to have a long thin shape and to have none of the central axes thereof overlap one another is found to be a mere matter of design variation that could be respectively set as appropriate by a party skilled in the art.

- Regarding claim 5

Forming the electromagnetic shielding member with metal is commonly carried out as described in, for example, document 1 (paragraph 0008). Also, embossing is commonly used for providing a protrusion in a metal member; therefore, it is found to be naturally carried out also for creating a protrusion in the member described in document 1.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019020

Box No. VIII **Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- The non-linear arrangement described in claim 2 is unclear in what type of arrangement it means.

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)*
Applicant's or agent's file reference **NEC04P193**	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/015159	**14.10.2004**	**26.12.2003**

International Patent Classification (IPC) or both national classification and IPC

Applicant
NEC CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☒ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Authorized officer
Facsimile No.	Telephone No.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/015159

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material

      ☐ in written format

      ☐ in computer readable form

   c. time of filing/furnishing

      ☐ contained in the international application as filed.

      ☐ filed together with the international application in computer readable form.

      ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/015159

Box No. III **Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 21-34

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 21-34

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form
- ☐ has not been furnished
- ☐ does not comply with the standard

the computer readable form
- ☐ has not been furnished
- ☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See Supplemental Box for further details.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/015159

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:

   ☒ paid partial additional fees

   ☐ paid additional fees under protest

   ☐ not paid additional fees

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with

   ☒ not complied with for the following reasons:

(1) The inventions of claims 1-20 are the inventions in which the height of at least two optical elements is regulated, whereas the inventions of claims 21-34 are the inventions relating to a method for forming a necessary optical element from an optical element array. Therefore, the two inventions cannot be said to have a special technical feature.

(2) The inventions of claims 1-20 represent prior art technology, as described, for example, in JP 5-67769 A (document 1). This document discloses a three-dimensional photoelectronic integrated circuit device in which a light emitting element Em and a light receiving element Pd are disposed in region 1, a drive circuit and other components are disposed in region 2 of each substrate Sn, and each light emitting element Em and light receiving element Pd has a fixed height (in particular, see Par. No. 0017-0025, Fig. 2 to Fig. 4).

Therefore, the inventions of claims 1, 5, 9, 18-20 clearly do not possess novelty based on document 1.

(3) The inventions of the remaining claims 2-4, 6-8, 10-17 of the claims 1-20 are further examined below. Among them, as has already been shown in document 1, a feature of regulating the height of the light emitting elements and light receiving elements is not a common special technical feature. Therefore, the specific feature of the inventions of claims 2, 4, 6, 8, 11-12, 15-16 is in that specific optical elements are provided, the specific feature of the inventions of claims 3, 7, 13-14 is in an electrode pattern, and the specific feature of the invention of claim 17 is in a solder.

(4) Therefore the present application includes inventions having at least five different special technical features: (i) claims 1, 5, 9-10, 18-20, (ii) claims 2, 4, 6, 8, 11-12, 15-16, (iii) claims 3, 7, 13-14, (iv) claim 17, and (v) claims 21-34.

(5) However, the additional fee was provided only for three groups of inventions.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts

   ☒ the parts relating to claims Nos. 1-20

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/015159

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2-4, 6-8, 10-17	YES
	Claims	1, 5, 9, 18-20	NO
Inventive step (IS)	Claims		YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims		NO

2. Citations and explanations:

Document 1: JP 5-67769 A
Document 2: JP 4-61175 A
Document 3: JP 6-275870 A

(1) Document 1 describes a three-dimensional photoelectronic integrated circuit device in which a plurality of light emitting elements (surface light emitting lasers), a plurality of light receiving elements (MSM-type photodetectors), and other drive circuits and signal processing circuits are disposed on each substrate Sn (see Par. No. 0017-0025, Fig. 2 to Fig. 4). Here, it is clear that the surface light emitting lasers or MSM-type photodetectors have respectively identical element structures and surface light emitting lasers and MSM-type photodetectors have different element structures.

Therefore, the inventions of claims 1, 5, 9, 18-20 do not appear to possess novelty over document 1.

(2) Using light collection members such as microlenses in a semiconductor integrated circuit device in which optical elements are integrated also represents the well-known technology (for example, see document 3 (Fig. 24 and the like)).

Therefore, the inventions of claims 2, 4, 6, 8, 11-12, 15-16 do not appear to involve an inventive step based on document 1 and document 3.

(3) Document 1 does not describe an electrode structure in details, but it can be easily assumed that identical electrode patterns are formed for surface light emitting lasers and MSM photodetectors.

Therefore, the inventions of claims 3, 7, 13-14 do not appear to involve an inventive step based on document 1.

(4) Furthermore, apparently it can be also easily conceived of assembling the light emitting elements (surface light emitting lasers) and a plurality of light receiving elements (MSM photodiodes) in the photoelectronic integrated circuit device described in document 1 (for example, see document 2 (Fig. 8, etc.)).

Therefore, the invention of claim 10 also does not appear to involve an inventive step.

(5) Document 1 describes a semiconductor integrated circuit device of a type in which optical elements are formed by direct film deposition or diffusion on a substrate. However, this method of forming optical elements on a substrate is not limiting, and assembling the components by soldering or the like is a well-known technique (for example, see Fig. 2). In particular, document 2 describes that solder bumps with different melting points are used, the connection operation with a solder having a high melting point is initially conducted, and then connection with a solder having a low melting point is conducted (page 3, lower left column).

Therefore, the invention of claim 17 does not appear to involve an inventive step based on documents 1-2.